

# Frontiers in Integrative Biological Research (FIBR)

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## Program Solicitation

NSF 03-581

*Replaces Document nsf02154*



**National Science Foundation**  
Directorate for Biological Sciences

### **Preliminary Proposal Due Date(s) *required*:**

October 20, 2003

Required for Submission of Full Proposals Only (due by 5 p.m. proposer's local time)

### **Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):**

October 20, 2003

Planning Grants

February 17, 2004

Full Proposals

## **SUMMARY OF PROGRAM REQUIREMENTS**

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### **General Information**

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#### **Program Title:**

Frontiers in Integrative Biological Research (FIBR)

#### **Synopsis of Program:**

The Frontiers in Integrative Biological Research (FIBR) Program supports integrative research that addresses major questions in the biological sciences. FIBR encourages investigators to identify major under-studied or unanswered questions in biology and to use innovative approaches to address them by integrating the scientific concepts and research tools from across disciplines including biology, math and the physical sciences, engineering, social sciences

and the information sciences. Proposers are encouraged to focus on the biological significance of the question, to describe the integrative approaches, and to develop a research plan that is not limited by conceptual, disciplinary, or organizational boundaries. Particularly encouraged are the inclusion of young scientists trained in an interdisciplinary environment or in non-biological disciplines, and partnerships with underrepresented minority serving and primarily undergraduate institutions and community colleges.

#### **Cognizant Program Officer(s):**

- Dr. Chris Greer, FIBR Program Director, telephone: (703)292-8470, fax: (703)292-9063, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)

#### **Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):**

- 47.074 --- Biological Sciences

#### **Eligibility Information**

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- **Organization Limit:** Proposals are invited from U.S. academic institutions, U.S. non-profit research organizations including museums, research laboratories, professional societies and similar organizations in the U.S. that are directly associated with educational or research activities, and consortia of such organizations with appropriate research and educational facilities. When a consortium of eligible organizations submits a proposal, it must be submitted as a single proposal with one organization serving as the lead and all other organizations as subawardees.
- **PI Eligibility Limit:** PIs, Co-PIs or Senior Personnel may be involved with only one planning grant and one full proposal in the same year. The same team of investigators may not submit both planning grant proposals and preliminary proposals in the same review cycle.
- **Limit on Number of Proposals:** None Specified.

#### **Award Information**

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- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 15 - Approximately 5 Planning Grants and up to 10 Research Grants
- **Anticipated Funding Amount:** \$15,000,000 (approximately) will be available for new FIBR awards in FY 2004, pending availability of funds

#### **Proposal Preparation and Submission Instructions**

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##### **A. Proposal Preparation Instructions**

- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

##### **B. Budgetary Information**

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

##### **C. Due Dates**

- **Preliminary Proposals (required) :**  
October 20, 2003  
Required for Submission of Full Proposals Only (due by 5 p.m. proposer's local time)
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):

## Proposal Review Information

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- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

## Award Administration Information

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- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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## I. INTRODUCTION

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The Directorate for Biological Sciences (BIO) of the National Science Foundation (NSF) announces the second competition for the Frontiers in Integrative Biological Research (FIBR) program. During the last decade, major breakthroughs in many areas including

genomics, information technology, high throughput instrumentation, imaging and wireless technologies, sensors, and Geographic Information System (GIS) now enable novel and integrative approaches to major challenges in biology. Thus, 21<sup>st</sup> Century Biology encompasses research that is multidimensional, multidisciplinary, integrative, education-oriented and global, encompassing conceptual and experimental approaches much different from those of the previous century. While existing BIO programs support these new directions in biological research, FIBR is designed to enable larger and more integrative or interdisciplinary projects than might be possible in any single program. Through FIBR BIO intends to support groups of researchers to capitalize on synergistic interactions and to employ diverse tools to achieve an integrative understanding of a clearly defined, major biological question. Proposals that fit within the scope of another existing program at NSF should be directed to that program (see Section IX below for additional information).

NSF BIO does not provide support for bioscience research with disease related goals, including work on the etiology, diagnosis and treatment of physical and mental disease, abnormality, or malfunction in human beings or animals. Animal models of such conditions and the development and testing of drugs and other procedures for their treatment also are not eligible for support. The submission of duplicate or substantially similar proposals concurrently for review by more than one program without prior NSF approval may result in the return of the redundant proposals. Research proposals to the Biological Sciences Directorate cannot be duplicates of proposals to any other Federal agency for simultaneous consideration. The only exceptions to this rule applicable to the FIBR program are proposals from PIs who are beginning investigators (individuals who have not been a principal investigator (PI) or co-principal investigator (co-PI) on a Federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants). For proposers who qualify under this exception, the box for "Beginning Investigator" must be checked on the proposal Cover Sheet.

## **II. PROGRAM DESCRIPTION**

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The FIBR program supports integrative research focused on a major question(s) in biology addressed through the creative application of a broad range of scientific concepts, strategies and research tools from both within and outside the biological sciences. FIBR projects are integrative at several conceptual levels. This includes the nature of the research paradigm (which may encompass multiple levels of organization or complexity, time and space, or range of organisms or processes), the use of combined experimental and theoretical analyses, and the application of a broad range of interdisciplinary approaches (e.g. math, physics, chemistry, social and behavioral sciences, computation and information sciences, etc.) in a single, coherent effort.

FIBR particularly encourages inclusion of young scientists trained in an interdisciplinary environment or in non-biological disciplines as co-PIs or postdoctoral research associates. The FIBR program also encourages partnerships with community colleges, baccalaureate, comprehensive, and underrepresented minority-serving institutions.

When preparing a FIBR proposal, proposers are encouraged to focus on the biological significance of the question, to describe the best integrative approaches, and to develop a plan that is not constrained by any perceived or real barriers and limitations, be they conceptual, disciplinary, organizational or budgetary. It is essential that there be an integrative conceptual model to link each element of the research plan to overall goals, and to serve as a framework for analysis of hypotheses being tested.

It is recognized that proposals that cross significant disciplinary, intellectual, or other boundaries may not fit readily within existing programs and an important goal of the FIBR program is to provide a home for such proposals. Proposals that fit within the scope of an existing program at NSF or elsewhere should be submitted directly to those programs. Examples of other programs at NSF that support large scale collaborative research can be found under Section IX below, Other Programs of Interest. Consult the NSF Guide to Programs for a complete description of NSF programs (<http://www.nsf.gov/cgi-bin/getpub?cg>).

The FIBR program supports the development of novel strategies, concepts and tools when these are essential elements within a broader plan to address a major and well-defined question in biology. However, projects whose primary or central focus is on new tools and strategies development are not appropriate for the FIBR program.

Large-scale projects employing broadly integrative approaches may involve international teams of investigators and NSF encourages international collaborations. FIBR program funds may be requested to support US investigators and students to work in international laboratories or foreign investigators and students to work in US laboratories. However, foreign counterparts should secure support for their efforts from their own national programs.

In FY2004, FIBR will support the following activities:

1. Full Proposals that address a major conceptual challenge in biology. A two stage review process is used for FIBR proposals. First, all proposers must submit a preliminary proposal that outlines the project as described below. Based upon review of preliminary proposals by a panel of outside experts, selected proposers will be encouraged to proceed to the second stage of review with submission of a full proposals. Those not encouraged remain eligible to submit full proposals although this is not recommended. Full proposals submitted without a corresponding preliminary proposal in the current review cycle will not be accepted.

2. Planning Grants that provide an opportunity for interested investigators to develop a well thought-out project plan. The outcome of a planning grant is expected to be an innovative, integrative research project that is different from ongoing research in the individual participants' laboratories and that leads directly to a preliminary proposal in the next cycle. Preliminary proposals are not required for planning grant proposals.

### III. ELIGIBILITY INFORMATION

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- **Organization Limit:** Proposals are invited from U.S. academic institutions, U.S. non-profit research organizations including museums, research laboratories, professional societies and similar organizations in the U.S. that are directly associated with educational or research activities, and consortia of such organizations with appropriate research and educational facilities. When a consortium of eligible organizations submits a proposal, it must be submitted as a single proposal with one organization serving as the lead and all other organizations as subawardees.
- **PI Eligibility Limit:** PIs, Co-PIs or Senior Personnel may be involved with only one planning grant and one full proposal in the same year. The same team of investigators may not submit both planning grant proposals and preliminary proposals in the same review cycle.

### IV. AWARD INFORMATION

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It is anticipated that approximately \$15 million will be available for new Planning Grants and Full Proposals in FY2004, contingent upon the quality of proposals received and pending the availability of funds.

The award size for Planning Grants will be up to \$50,000 for one year. The award size for Research Grants will be up to a total of approximately \$5 million for up to five years.

Funding decisions for Planning Grant proposals are anticipated by late December 2003, with awards expected to start in February 2004. Funding decisions for full research proposals are anticipated by the end of July 2004, with awards expected to start in September 2004.

### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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#### A. Proposal Preparation Instructions

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##### **Preliminary Proposals (*required*):**

Preliminary Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

The following exceptions and additions apply to proposals submitted to this Program:

Submission of Preliminary Proposals is required for **Full Proposals** only. Preliminary proposals are not required for Planning Grants. Proposals that are not compliant with the guidelines may not be reviewed. It is the submitting organizations responsibility to ensure that the proposal is compliant with all applicable guidelines.

Preliminary proposals must contain the items listed below and strictly adhere to the specified page limitations. No additional information may be provided as an appendix or by links to web pages. Figures and tables must be included within the applicable page limit. All elements of the proposal, including legends and tables, must meet the formatting requirements for font size, characters per inch, margins, etc. as specified in the Grant Proposal Guide.

Based on evaluation by a panel of outside experts, the FIBR Working Group expects to encourage approximately 20 to 25 Principal Investigators (PIs) to submit full proposals.

By December 17, 2003 the program will e-mail PIs whose preliminary proposals are encouraged for full proposal submission.

Preliminary proposals should provide a brief overview of the project and should include sufficient information to allow assessment of the main ideas and approaches. Preliminary proposals must include the following items:

- **FastLane Cover Sheet:** Select the program solicitation number, NSF 03-581, from the pull down list. The FIBR program will automatically be selected. An informative title for the proposed FIBR project, that begins with "FIBR Preliminary Proposal:", must be provided. Check the box indicated for preliminary proposal. Entries on the FastLane Cover Sheet are limited to the principal investigator and a maximum of four co-principal investigators. Additional co-principal investigators should be listed on the Project Summary page and entered into FastLane as Senior Investigators (this latter provision allows their biographical sketches to be included in the FastLane proposal). For more FastLane instructions see section D below.
- **Project Summary (1-page limit).** Provide a brief description of the research program. This summary should be intelligible to a general audience. At the top of this page include the title of the project, the name of the PI and the lead institution and/or organization, list of Co-PIs and other Senior Personnel with their institutions and/or organizations. Provide a clear and concise statement of the major question(s) in biology that will be addressed in the proposed research and summarize the approaches that will be used to address this question.
- **Project Description.** The project description will include:
  1. Describe the vision and goals for the project including an explicit statement of the major question(s) in biology to be addressed, the proposed creative approaches to attain the goals, expected outcomes, and how the proposed project will advance the frontiers of biology (Maximum 5 pages).
  2. Education and Training Plan (maximum 2 pages). Describe how the proposed research will be integrated with educational activities and how these activities promote diversity as an integral component. Indicate how students trained in this research will be better able to handle emerging research problems in biological areas.
- **References Cited.** Indicate with an asterisk any cited publications that resulted from prior research funded by NSF for the PI, or Co-PI.
- **List of key personnel involved (maximum 3 pages),** with a description of what each person uniquely brings to the project and how individual efforts are integrated to produce positive synergy
- **Biographical sketches (2 pages each).** Biographical sketches must be listed for the PI, Co-PIs and other Senior Personnel listed on the Project Summary page.
- **Current and Pending Support** for the PI, Co-PIs, and Senior Personnel must be included.
- **No budget is required;** however please enter \$2 in the Requested Amount box on the FastLane Cover Sheet (this entry allows correct FastLane processing).
- **Special Information and Supplementary Documentation** is limited to the following letters of commitment documenting collaborative arrangements of significance but must not include general letters of endorsement.

### **Full Proposal Instructions:**

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

The following exceptions and additions apply to proposals submitted to this Program:

Full proposals will be accepted only from PIs who have submitted preliminary proposals in the current review cycle. Submission of full proposals by PIs whose preliminary proposals received a review recommendation of 'not encouraged' is strongly discouraged.

- **FastLane Cover Sheet:** Select the program solicitation number, NSF 03-581, from the pull down list. The FIBR program will automatically be selected. An informative title for the proposed FIBR project, that begins with "FIBR:", must be provided. Entries on the FastLane Cover Sheet are limited to the principal investigator and a maximum of 4 co-principal investigators. Additional co-principal investigators should be listed on the Project Summary page and entered into FastLane as Senior Investigators (this latter provision allows their biographical sketches to be included in the FastLane proposal. For more FastLane instructions see section D below.
- **Project Summary (1-page limit).** Provide a brief description of the research program. This summary should be intelligible to a general audience. At the top of this page include the title of the project, the name of the PI and the lead institution and/or organization, list of Co-PIs and other Senior Personnel with their institutions and/or organizations. Provide a clear and concise statement of the major question(s) in biology that will be addressed in the proposed research and summarize the approaches that will be used to address this question.
- **Project Description (maximum 15 pages).**

1. **Results from Prior Research:** Describe prior research of PI or co-PIs funded by NSF that is directly relevant to the proposed project.
2. **Proposed Research:** Describe the vision and goals of the proposed research, the major question(s) in biology to be addressed, approaches to attain the goals, any new techniques or tools expected to be developed, expected outcomes, and how the proposed project will advance the frontiers of biology. Articulate unifying and integrative aspects of the proposed research as well as the innovative ideas of the research.
3. **Education and Training Plan:** Describe how the proposed research will be integrated with educational activities and how these activities promote diversity as an integral component. Indicate how students trained in this research will be better able to handle emerging research problems in biological sciences. These plans should take advantage of unique aspects of the proposed research and the research environment, with particular emphasis on increasing participation of underrepresented groups or students and faculty from under-served institutions or both.

- **References Cited.** Indicate with an asterisk any cited publications that resulted from prior research funded by NSF for the PI, or Co-PI.
- **Biographical sketches for key personnel (PI, Co-PIs, and each of the senior personnel listed on the Project Summary page).** Use the format described in GPG.
- **Budget.** Follow instructions in GPG. Develop a realistic project budget that is consistent with the proposed activities. Provide detailed budget justification.
- **Facilities, Equipment:** Provide a description of available facilities and priorities for its use. For FIBR projects requiring additional equipment, justify the need for these resources in the context of the innovative work proposed.
- **In the Special Information and Supplementary Documentation section, include the following:**

1. List of key personnel involved (maximum 3 pages), with description of what each person uniquely brings to the project and how they are integrated to produce positive synergies;
2. Provide a detailed management plan (maximum 3 pages) including means of communication and data tracking/management within the group, management of intellectual property resulting from the project, and timeline of activities;
3. Means of sharing the outcome of the research with the rest of the scientific community, eg. publications, web sites, data bases, genome, EST, cDNA or other sequences, microarray data, etc. (maximum 2 pages). The description should be specific and describe what, how, and when the community would have access to the outcome of the project. This is particularly important for the projects that will produce tangible research tools and resources;
4. A list, in a single alphabetized table, with the full names of all people with conflicts of interest for all senior personnel (PI and Co-PI's) and any named personnel whose salary is requested in the project budget. Conflicts to be identified are (1) PhD thesis advisors or advisees, (2) collaborators or co-authors, including postdocs, for the past 48 months, and (3) any other individuals or institutions with which the investigator has financial ties (please specify type).

### **Planning Grant Proposal:**

Planning Grant proposals submitted in response to this program announcement/solicitation should be prepared and submitted in

accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

The following exceptions and additions apply to proposals submitted to this Program:

Proposals for planning grants to support activities that will lead to the submission of a competitive FIBR preproposal may be submitted. Examples of planning activities include, but are not limited to, focused workshops or virtual meetings, to generate proof of concept, and/or to develop management and research interactions. NSF plans to solicit FIBR planning grants only in FY2004. The same team of investigators may not submit both planning grant proposals and preliminary proposals in the same year. An individual researcher may be involved with only one planning grant and one FIBR research grant in the same year.

The leader of the group should submit the planning grant proposal through her/his institution. Planning grant proposals should contain the following items:

- **FastLane Cover Sheet:** Select the program solicitation number, NSF 03-581, from the pull down list. The FIBR program will automatically be selected. An informative title for the proposed FIBR project, that begins with "FIBR: Planning", must be provided. Entries on the FastLane Cover Sheet are limited to the principal investigator and a maximum of 4 co-principal investigators. Additional co-principal investigators should be listed on the Project Summary page and entered into FastLane as Senior Investigators (this latter provision allows their biographical sketches to be included in the FastLane proposal. For more FastLane instructions see section D.
- **Project Summary (1-page limit).** Provide a brief description of the planning activities. At the top of this page include the title of the project, the name of the PI and the lead institution, list of Co-PIs and other Senior Investigators with their institutions. This summary should be intelligible to a general audience. Summarize the intellectual context for the anticipated FIBR proposal including the major question(s) in biology that would be addressed and list the planning activities expected to lead to a competitive proposal.
- **Project description (maximum 5 pages).**
  1. Describe prior research by the PI that was funded by NSF and is directly relevant to the proposed project.
  2. **Project subject area:** Describe the intellectual context for the planned FIBR proposal including the major question(s) in biology to be addressed, plans for innovative and/or integrative approaches, and anticipated broader impacts including training and educational opportunities.
  3. **Planned activities:** Describe the activities to be conducted under the proposed planning grant and indicate how these activities would lead to a competitive FIBR preproposal submission. Include a timeline for activities that culminates in preproposal preparation and submission for the FIBR program deadline (first week of November each year).
- **References Cited.** Indicate with an asterisk any cited publications that resulted from prior research funded by NSF for the PI, or Co-PI.
- **Biographical Sketches.** Brief biographical information is required for the PI, Co-PIs, and Senior Personnel listed on the Project Summary page. Use GPG format.
- **Proposal Budget** that is consistent with the proposed activities. Provide a clearly described budget justification. Award size is limited to a maximum of \$50,000 for one year.
- **Current and Pending Support** for the PI, Co-PIs, and Senior Personnel

Proposers are reminded to identify the program announcement/solicitation number (03-581) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

## **B. Budgetary Information**

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### **Cost Sharing:**

Cost sharing is not required in proposals submitted under this Program Solicitation.

## **C. Due Dates**

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Proposals must be submitted by the following date(s):

**Preliminary Proposals *required*):**

October 20, 2003

Required for Submission of Full Proposals Only (due by 5 p.m. proposer's local time)

**Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

October 20, 2003

Planning Grants

February 17, 2004

Full Proposals

**D. FastLane Requirements**

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Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

*Submission of Electronically Signed Cover Sheets.* The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the [Grant Proposal Guide](#) for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

**VI. PROPOSAL REVIEW INFORMATION**

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**A. NSF Proposal Review Process**

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Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that

Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

**What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

**What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

NSF staff will give careful consideration to the following in making funding decisions:

***Integration of Research and Education***

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

***Integrating Diversity into NSF Programs, Projects, and Activities***

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

**Additional Review Criteria:**The National Science Board approved criteria will apply. Additional merit review considerations include overall impact of the research on biology, integrative nature of the research plan, novelty of the proposed approaches, and effectiveness in broadening participation. Full Proposals will be reviewed for the robustness of the management plan.

**B. Review Protocol and Associated Customer Service Standard**

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All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc and/or panel review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

## **VII. AWARD ADMINISTRATION INFORMATION**

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### **A. Notification of the Award**

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Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

### **B. Award Conditions**

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An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); \* or Federal Demonstration Partnership (FDP) Terms and Conditions \* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

\*These documents may be accessed electronically on NSF's Website at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at <http://www.gpo.gov>.

### **C. Reporting Requirements**

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For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project

participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

## VIII. CONTACTS FOR ADDITIONAL INFORMATION

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General inquiries regarding this program should be made to:

- Dr. Chris Greer, FIBR Program Director, telephone: (703)292-8470, fax: (703)292-9063, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)
- Divisional FastLane Contact: Sarah Clark, telephone: (703)292-8470, fax: (703)292-9063, email: [biofl@nsf.gov](mailto:biofl@nsf.gov)

For questions related to the use of FastLane, contact:

- The FastLane Help Desk, telephone: 800-673-6188, email: [fastlane@nsf.gov](mailto:fastlane@nsf.gov)
- The Divisional FastLane Contact answers policy/program announcement questions, telephone: 703 292-8470, email: [biofl@nsf.gov](mailto:biofl@nsf.gov)

## IX. OTHER PROGRAMS OF INTEREST

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The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF *E-Bulletin*, which is updated daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's *Custom News Service* (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

Examples of other programs at NSF that support large scale, collaborative research include the following:

- Assembling the Tree of Life: [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf03536](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf03536)
- Biocomplexity in the Environment (BE): [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf02167](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf02167)
- Plant Genome Research Program: [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf02187](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf02187)
- 2010 Project: [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf02175](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf02175)
- Nanoscale Science and Engineering (NSE): [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf02148](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf02148)
- Collaborative Research in Chemistry (CRC): [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf02157](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf02157)
- Physics Frontiers Centers (PFC): [http://www.nsf.gov/mps/divisions/phy/about/c\\_programs.htm#pfc](http://www.nsf.gov/mps/divisions/phy/about/c_programs.htm#pfc)
- Focused Research Groups (in Math) FRG: [http://www.nsf.gov/mps/divisions/dms/about/c\\_programs.htm#frg](http://www.nsf.gov/mps/divisions/dms/about/c_programs.htm#frg)
- Information Technology Research (ITR): [http://www.nsf.gov/pubsys/ods/getpub.cfm?ods\\_key=nsf02168](http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf02168)
- Science and Technology Centers (STC): <http://www.nsf.gov/od/oia/programs/stc/>
- Integrative Graduate Education and Research Traineeship Program (IGERT): <http://www.nsf.gov/home/crssprgm/igert/start.htm>

Consult the NSF Guide to Programs (<http://www.nsf.gov/cgi-bin/getpub?gp>) for information about these and other activities.

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

*Facilitation Awards for Scientists and Engineers with Disabilities (FASSED)* provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

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## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant

institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

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